

(12) INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(19) World Intellectual Property Organization International Bureau



(43) International Publication Date  
16 June 2005 (16.06.2005)

PCT

(10) International Publication Number  
**WO 2005/054318 A1**

(51) International Patent Classification<sup>7</sup>: C08F 290/06, C08L 51/00, A61K 9/00, C08J 3/075, C08L 101/14

(21) International Application Number:  
PCT/NL2004/000845

(22) International Filing Date: 3 December 2004 (03.12.2004)

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:  
03078852.5 4 December 2003 (04.12.2003) EP

(71) Applicant (for all designated States except US): UNIVERSITEIT UTRECHT [NL/NL]; Heidelberglaan 8, NL-3584 CS Utrecht (NL).

(72) Inventors; and

(75) Inventors/Applicants (for US only): HENNINK, Willemus, Everhardus [NL/NL]; Zuidplaslaan 120, NL-2743 CZ Waddinxveen (NL). VAN NOSTRUM, Cornelis, Franciscus [NL/NL]; Achterstraat 56, NL-5251 CV Vlijmen (NL).

(74) Agent: WINCKELS, J.H.F.; Johan de Wittlaan 7, NL-2517 JR Den Haag (NL).

(81) Designated States (unless otherwise indicated, for every kind of national protection available): AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BW, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NA, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM, ZW.

(84) Designated States (unless otherwise indicated, for every kind of regional protection available): ARIPO (BW, GH, GM, KE, LS, MW, MZ, NA, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IS, IT, LT, LU, MC, NL, PL, PT, RO, SE, SI, SK, TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

Published:

- with international search report
- before the expiration of the time limit for amending the claims and to be republished in the event of receipt of amendments

For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.

WO 2005/054318 A1

(54) Title: STEREOCOMPLEX HYDROGELS WITH TUNABLE DEGRADATION TIMES

(57) Abstract: The present invention relates to stereocomplex hydrogels for drug delivery and tissue engineering. The hydrogels comprise block or graft polymers with at least one hydrophilic region and at least two enantiomerically enriched degradable regions, which may represent grafts or terminal blocks. In the hydrogels, degradable regions of opposite chirality form racemic crystallites, leading to the physical crosslinking of the polymers. Furthermore, the significance of the terminal groups of the degradable blocks for the degradability of the hydrogel is disclosed. Hydrogels from polymers whose degradable regions are characterised by the absence of terminal hydroxyl groups are shown to be particularly stable, having long lifetimes and a high potential for sustained drug release over extended periods such as weeks or months. In other aspects, the invention provides methods for the preparation of hydrogel compositions, kits from which the hydrogels can be prepared, and uses of the hydrogels.